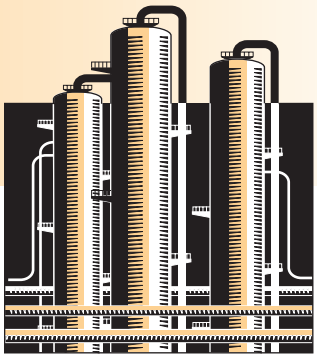
PETROLEUM

Project Fact Sheet



Catalytic Cracking Demonstration Plant

Low-profile fluid catalytic cracking demonstration plant combines cutting-edge technology and scalability

Benefits

- Projected annual energy savings estimated at 122 billion Btu for each unit processing 10,000 barrels of finished product daily
- Reduced air emissions of more than 10,000 tons per year per unit
- Projected decrease in energy costs $300,000 per year for each unit
- The unit's low profile means that construction and operational costs are lower
- Because of its low-profile design, this technology can be scaled down cost-effectively, enabling the small refiner of the future to be competitive

Applications

Fluid bed catalytic cracking technology is primarily used by the petroleum refining industry, but because of the flexibility of its design, the low-profile technology can also be applied in petroleum production as a viscosity-breaker. In addition, the technology may be used to maximize chemical feedstocks such as those used in the production of alcohol, ethyl benzene, and styrene.

Project Partners

NICE^3 Program
Washington, DC

Process Innovators, Inc.
Sandy, UT

Utah Office of Energy Services
Salt Lake City, UT

Petroleum refiners use fluid catalytic cracking (FCC) technology to convert crude oil to blending stocks for use in gasoline, diesel, and heating oil. Construction and operation of the 200-foot tall FCC units are expensive, and process control improvements are slow to be adopted.

Process Innovators, Inc., will demonstrate a new, low-profile FCC process that will increase yields and lower costs for any size of refining operation. By using multiple reactors instead of the current single-reactor technology, the company will be able to confine the unit's height to 50 feet and also incorporate advances such as a short residence time, rapid disengaging, a high catalyst-to-oil ratio, and the matching of feed reactivity to catalyst activity.

Catalytic Cracking Unit

Catalytic cracking converts heavy crude oil into gasoline, diesel, fuel oil, and petrochemicals. The new process does the conversion more efficiently with less emissions and dramatic savings in costs.

Because of its low profile design, this technology can be scaled down cost-effectively. This will enable the small refiner of the future to be competitive.

Project Description

Goal: Process Innovators will demonstrate a scalable catalytic cracking technology and prove that it will increase yields and lower costs for any size of refining operation. The NICE^3 grant will allow this small business to overcome the monetary barriers to carry out development of a multistage reactor using a parallel flow reactor system that optimizes product yields.

The low-profile catalytic cracking process that will be demonstrated brings significant improvements in performance and cost reduction. The process improves existing FCC unit technology by incorporating the most current technological and process advances into a low-profile, multiple-reactor unit. These advances include short residence time, rapid disengaging, a high catalyst-to-oil ratio, and the matching of feed reactivity to catalyst activity.

Progress and Milestones

- Construction of the unit has been completed and the unit is in the process of being started up.
- Catalyst has been circulated--normal startup problems are being solved.
- A test matrix for testing the unit has been designed.
- Process Innovators has begun marketing the technology through a refinery database.

NICE^3 – National Industrial Competitiveness through Energy, Environment, and Economics:
An innovative, cost-sharing program to promote energy efficiency, clean production, and economic competitiveness in industry.
This grant program provides funding to state and industry partnerships for projects that demonstrate advances in energy efficiency and clean production technologies. Awardees receive a one-time grant of up to $525,000. Grants fund up to 50% of total project cost for up to 3 years.

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